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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,260	08/25/2003	Anand G. Dabak	TI-35237	7206
23494 7590 10/09/2007 TEXAS INSTRUMENTS INCORPORATED P O BOX 655474, M/S 3999 DALLAS, TX 75265			EXAMINER PHAN, MAN U	
			ART UNIT 2619	PAPER NUMBER
			NOTIFICATION DATE 10/09/2007	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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# Office Action Summary

Application No.

10/649,260

Applicant(s)

DABAK ET AL.

Examiner

Man Phan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 01 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☐ Claim(s) \_\_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13, 16-23 and 25 is/are rejected.
- 7) ☒ Claim(s) 14, 15, 24, 26 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_.

***Response to Amendment and Argument***

1. This communication is in response to applicant's 08/01/2007 Amendment in the application of Dabak et al. for the "Multi-carrier reception for ultra-wideband (UWB) systems" filed 08/25/2003. This application claims priority from provisional application 60/409,662 filed 09/10/2002. The amendment and response has been entered and made of record. Claims 1-26 are pending in the application.
2. Applicant's remarks and argument to the rejected claims are insufficient to distinguish the claimed invention from the cited prior arts or overcome the rejection of said claims under 35 U.S.C. 103 as discussed below. Applicant's argument with respect to the pending claims have been fully considered, but they are not persuasive for at least the following reasons.
3. In response to applicant's argument that the combination of cited references fails to present a prima facie case of obviousness. In response, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). It is not necessary that a "prima facie" case of unpatentability exist as to the claim in order for "a substantial new question of patentability" to be present as to the claim. Thus, "a substantial new question of patentability" as to a patent claim could be present even if the examiner would not necessarily reject the claim as either fully anticipated by, or obvious in view of, the prior art patents or printed publications. As to the importance of the difference between "a

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substantial new question of patentability” and a “prima facie” case of unpatentability see generally *In re Etter*, 756 F.2d 852, 857 n.5, 225 USPQ 1, 4 n.5 (Fed. Cir. 1985). Also, See MPEP § 2141.01(a) for a discussion of analogous and nonanalogous art in the context of establishing a prima facie case of obviousness under 35 U.S.C. 103. See MPEP § 2131.05 for a discussion of analogous and nonanalogous art in the context of 35 U.S.C. 102. 904.02.

In response to Applicant’s argument that there is no suggestion to combine the references, i.e., Nakamura et al. (US#6,920,173) and Kim (US#6,810,007) as proposed in the office action. The Examiner recognizes that references cannot be arbitrarily combined and that there must be some reason why one skilled in the art would be motivated to make the proposed combination of primary and secondary references. *In re Nomiya*, 184 USPQ 607 (CCPA 1975). However, there is no requirement that a motivation to make the modification be expressly articulated. The test for combining references is what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. *In re McLaughlin*, 170 USPQ 209 (CCPA 1971). It must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant’s disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

4. In response to Applicant’s argument that the reference does not teach or reasonably suggest the functionality upon which the Examiner relies for the rejection. The Examiner first emphasizes for the record that the claims employ a broader in scope than the Applicant’s

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disclosure in all aspects. In addition, the Applicant has not argued any narrower interpretation of the claim limitations, nor amended the claims significantly enough to construe a narrower meaning to the limitations. Since the claims breadth allows multiple interpretations and meanings, which are broader than Applicant's disclosure, the Examiner is required to interpret the claim limitations in terms of their broadest reasonable interpretations while determining patentability of the disclosed invention. See MPEP 2111. In other words, the claims must be given their broadest reasonable interpretation consistent with the specification and the interpretation that those skilled in the art would reach. See *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000), *In re Cortright*, 165 F.3d 1353, 1359, 49 USPQ2d 1464, 1468 (Fed. Cir. 1999), and *In re American Academy of Science Tech Center*, 2004 WL 1067528 (Fed. Cir. May 13, 2004). Any term that is not clearly defined in the specification must be given its plain meaning as understood by one of ordinary skill in the art. See MPEP 2111.01. See also *In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989), *Sunrace Roots Enter. Co. v. SRAM Corp.*, 336 F.3d 1298, 1302, 67 USPQ2d 1438, 1441 (Fed. Cir. 2003), *Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc.*, 334 F.3d 1294, 1298 67 USPQ2d 1132, 1136 (Fed. Cir. 2003). The interpretation of the claims by their broadest reasonable interpretation reduces the possibility that, once the claims are issued, the claims are interpreted more broadly than justified. See *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969). Also, limitations appearing in the specification but not recited in the claim are not read into the claim. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Therefore, the failure to significantly narrow definition or scope of the claims and supply arguments commensurate in scope with the claims implies the Applicant intends broad

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interpretation be given to the claims. The Examiner has interpreted the claims in parallel to the Applicant in the response and reiterates the need for the Applicant to distinctly define the claimed invention.

5. Applicant's argument with respect to the rejected claims (pages 7, last paragraph) that the cited references fail to teach or suggest the "*stripping redundancy from a symbol followed by a despreading of the symbol*". However, Kim (US#6,810,007) discloses in Fig. 1B a block diagram of an OFDM receiving system for receiving a signal transferred from the transmission system of Fig. 1A, in which a cyclic prefix remover 112 removes the cyclic prefix added in the transmission system (*the process of stripping redundancy inherent in most media data*) (Col. 3, lines 39 plus). Furthermore, Nakamura et al. (US#6,920,173) discloses a spread-spectrum signal receiver apparatus for receiving a spread-spectrum signal and demodulating transmit data from the signal, including an interference canceller for producing a replica of an interference signal from the receive signal using a despreading code comprising a combination of the first code (*the process of despreading the symbol after removing the redundancy*); and a demodulator for demodulating transmit data, from the signal from which the replica has been subtracted, by despread processing using a spreading code on the transmit side (*the process of demodulating the symbol after the despreading process*) (Col. 8, lines 60 plus).

Since no substantial amendments have been made and the Applicant's arguments are not persuasive, the claims are drawn to the same invention and the text of the prior art rejection can be found in the previous Office Action. Therefore, the Examiner maintains that the references cited and applied in the last office actions for the rejection of the claims are maintained in this office action.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-13 and 16-23, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (US#6,920,173) in view of Kim (US#6,810,007).

With respect to claims 16, 25, the references disclose a novel system and method for receiving transmissions in a wireless communication system with a large data bandwidth, according to the essential features of the claims. Nakamura et al. (US#6,920,173) disclose a spread-spectrum signal receiver apparatus for receiving a spread-spectrum signal, which has been spread by a spreading code comprising a combination of a first code decided by a spreading factor and a second code that differs for every user, and demodulating transmit data from the

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received signal, and to an interference cancellation apparatus for generating a replica of an interference signal from the received signal (Col. 8, lines 60 plus). As shown in Fig. 1 for the structure of an interference cancellation unit are a receiver 100, an interference cancellation unit 200 according to this embodiment, and a receive demodulator 400. The interference cancellation unit 200 is provided for each user channel within the interference canceller (see Fig. 17); only one channel is shown in Fig. 1. The interference cancellation unit 200 includes a despreader 201 for multiplying a receive signal S by a despreading code that is identical with the spreading code, thereby outputting a despread signal; a demodulator 202 for demodulating "1", "0" of user data and control data on the basis of the result of despreading; an attenuator 203 for attenuating the demodulated signal by multiplying the result of demodulation by a damping coefficient that conforms to the degree of reliability; a re-spreader 204 for spreading the demodulated signal again to thereby output an interference replica; and a symbol-replica interface 205 for creating and sending a symbol replica (Col. 12, lines 40 plus).

However, Nakamura does not disclose expressly the redundancy elimination circuit coupled to the ADC for removing of cyclic prefix. In the same field of endeavor, Kim (US#6,810,007) teaches an orthogonal frequency division multiplexing (OFDM) transmission/receiving system and a block encoding method therefor. Fkim teaches in Fig. 1B a block diagram of an orthogonal frequency division multiplexing (OFDM) receiving system for receiving a signal transferred from the transmission system of Fig. 1A. The receiving system of Fig. 1B includes an LPF 110, an analog-to-digital converter (ADC) 111, a cyclic prefix remover 112, an FFT 113, a Q-ary demodulator 114, a parallel-to-serial converter (PSC) 115, and a block decoder 116. The LPF 110 in the receiving system filters the transmitted OFDM



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signal at the same frequency band as the LPF 106 of the transmission system. The ADC 111 converts a filtered signal into a digital signal, and the cyclic prefix remover 112 removes the cyclic prefix added in the transmission system. The FFT 113, the Q-ary demodulator 114, the PSC 115 and the block decoder 116 perform inverse processes of the processes performed by the counterparts of the transmission system, thereby restoring an OFDM signal (See Fig. 2A; Col. 3, lines 39 plus).

It's noted that a number of different types of multi-carrier or OFDM systems including, but not limited to, Ultra-Wideband (UWB), Wireless Local Area Network (WLAN), 802.16e, and 3.9 and fourth generation (4G) cellular systems utilizing the IEEE 802.15.3a standard. In general, UWB transmitter taking advantage of both code division multiple access (CDMA) and orthogonal frequency division multiplexing (OFDM) techniques to create a multi-carrier UWB transmitter. The multi-carrier UWB is capable of avoiding interferers by eliminating signal transmissions in the frequency bands occupied by the interferers.

Regarding claims 17-19, Nakamura further teaches wherein at a transmitter, symbols to be transmitted are first spread with a first spreading code and then modulated (Fig. 10; Col. 1, lines 24 plus).

Regarding claims 20, 23, Kim further teaches wherein the redundancy elimination circuit (REC) contains circuitry to remove replicated symbols and cyclic redundancies (Fig. 2A; Col. 3, lines 39 plus)

Regarding claims 21-22, Kim further teaches in Fig. 1B a block diagram of an orthogonal frequency division multiplexing (OFDM) receiving system for receiving a signal transferred from the transmission system, wherein at a transmitter, symbols to be transmitted

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are modulated using orthogonal frequency division multiplexing (OFDM), and wherein the demodulator applies a Fourier transform to the digital symbol (Col. 1, lines 24 plus).

With respect to claims 1-13, they are method claims corresponding to the apparatus claims 16-23, 25 as discussed in paragraph above. Therefore, claims 1-13 are analyzed and rejected as previously discussed with respect to claims 16-23, 25.

One skilled in the art of communications would recognize the need for a novel system and method for receiving OFDM transmissions in spread spectrum signal receiver, and would apply Kim's novel use of a redundancy elimination circuit coupled to the ADC for removing of cyclic prefix into Nakamura's method for receiving a spread spectrum signal and demodulating transmit data from the signal. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Kim's OFDM transmission/receiving system and block encoding method therefor into Nakamura's spread spectrum signal receiver apparatus and interference cancellation apparatus with the motivation being to provide a system and method for a multi carrier reception for UWB systems.

***Allowable Subject Matter***

9. Claims 14-15 and 24, 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is an examiner's statement of reasons for the indication of allowable subject matter: The closest prior art of record fails to disclose or suggest wherein there are a

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plurality of ADC and digital sections forming a plurality of ADC and digital units (ADU), and the receiver further comprising a plurality of filters and mixer units, wherein each filter and mixer unit has an input coupled to the analog section and an output coupled to an ADU, the filter and mixer unit containing circuitry to extract a frequency band from a signal provided by the analog section and to mix the frequency band to an intermediate frequency, as expressly recited in the claims.

### *Conclusion*

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The Jiang (US#7,266,162) is cited to show the carrier frequency offset estimator for OFDM systems.

The Kadous et al. (US#7,184,713) is cited to show the rate control for multi-channel communication systems.

The Kadous et al. (US#2003/0095508) is cited to show the rate selection for an OFDM system.

The Chung et al. (US#2005/0259566) is cited to show the method and apparatus for transferring channel information in OFDM communications.

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION THIS ACTION IS MADE FINAL**. See MPEP ' 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE**

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**MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Phan whose telephone number is (571) 272-3149. The examiner can normally be reached on Mon - Fri from 6:00 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel, can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2600.

14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have any questions on access to

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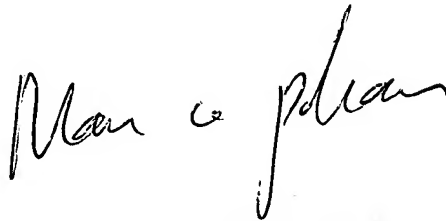
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the Private PAIR system, contact the Electronic Business Center (EBC) at toll free 1-866-217-9197.

Mphan

Sept. 28, 2007

A handwritten signature in black ink, appearing to read "Man U. Phan". The signature is written in a cursive, flowing style.

**MAN U. PHAN  
PRIMARY EXAMINER**